

Notice of Allowability**Application No.**

10/700,310

Applicant(s)

ROBINSON, IAN

Examiner

SIU M. LEE

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 7/7/2010.
2. ☒ The allowed claim(s) is/are 1,5,10,11,21,44,49,54-56,63 and 64.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 9/15/2010.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Christopher Harris on 9/15/2010.

(1) Regarding claim 1:

Please replace claim 1 by the following:

---A multi-carrier transmitter assembly, comprising:

a digital exciter that provides a digital multi-carrier signal from baseband data, the digital multi-carrier signal comprising a plurality of time interleaved digital signals;

a digital-to-analog converter that converts the digital multi-carrier signal into an analog multi-carrier signal;

a signal distributor that deserializes the analog multi-carrier signal into a plurality of analog carrier signals, the signal distributor comprising a time division demultiplexer that separates the plurality of time interleaved analog signals into the plurality of analog carrier signals;

a plurality of antennas, each of the plurality of antennas transmitting at least one of the plurality of analog carrier signals;

wherein the signal distributor further comprises at least one passband filter having at least one passband, each of the at least one passband having an associated center frequency, the digital exciter being operative to adjust the respective center frequencies of the at least one passband.---

(2) Regarding claim 4:

Cancel claim 4.

(3) Regarding claim 5:

Line 1, change "The assembly of claim 4" to ---The assembly of claim **1**".

(4) Regarding claim 44:

Please replace claim 44 by the following:

---A receiver assembly, comprising:

a plurality of antennas that each receives an analog signal comprising at least one frequency band of interest and at least one frequency band containing an interfering signal;

a signal combiner that combines at least two of the analog signals from the plurality of antennas into a multi-carrier signal;

a bypass configured to allow an analog signal from one of the plurality of antennas to bypass the signal combiner;

an analog-to-digital converter that creates a digital representation of the multi-carrier signal;

a digital processing component that receives the digital representation of the multi-carrier signal and produces a control signal from the digital representation **and the analog signal from the bypass**, and for each analog signal representing an associated antenna, specifying the at least one frequency band containing the interfering signal; and

a plurality of electrically adjustable stopband filters, each electrically adjustable stopband filter being associated with one of the plurality of antennas, a given electrically adjustable stopband filter being electrically adjustable to change respective associated center frequencies of at least one stopband associated with the filter in response to the control signal associated with the associated antenna of the given adjustable filter as to attenuate the specified at least one frequency band within the analog signal received at the associated antenna of the given adjustable filter.---

(5) Regarding claim 56:

A receiver assembly, comprising:

a plurality of antennas that each receives an analog signal comprising at least one frequency band of interest and at least one frequency band containing an interfering signal;

a plurality of mixers for downconverting the plurality of analog signals to an intermediate frequency, wherein each mixer has an associated oscillator producing appropriate signals for downconverting the analog signals;

a plurality of spreaders for spreading the downconverted analog signals and produce a plurality of spreaded signals;

a code division multiplexer that combines the plurality of spreaded signals from the plurality of spreaders into an analog multicarrier signal;

an analog-to-digital converter that receives the analog multicarrier signal and creates a multicarrier digital signal comprising a representation of each analog signal in digital form;

a digital processing component that receives the digital representation of each analog signal and produces a control signal from the digital representation for each analog signal, representing an associated antenna, wherein the digital processing component further comprises control components for computing and maintaining the codes for each signal path and providing codes to the spreaders; and

a plurality of passband filters, each passband filter being associated with one of the plurality of antennas.---

Allowable Subject Matter

2. Claims 1, 5, 10-11, 44, 49-52, 54-56, 63-64 are allowed.
3. The following is an examiner's statement of reasons for allowance:

(1) Regarding claims 1, 5, and 10-11:

The present invention describes a multi-carrier transmitter assembly, comprising a digital exciter that provides a digital multi-carrier signal from baseband data, the digital multi-carrier signal comprising a plurality of time interleaved digital signals; a digital-to-analog converter that converts the digital multi-carrier signal into an analog multi-carrier

signal; a signal distributor that deserializes the analog multi-carrier signal into a plurality of analog carrier signals, the signal distributor comprising a time division demultiplexer that separates the plurality of time interleaved analog signals into the plurality of analog carrier signals; a plurality of antennas, each of the plurality of antennas transmitting at least one of the plurality of analog carrier signals. wherein the signal distributor further comprises at least one passband filter having at least one passband, each of the at least one passband having an associated center frequency, the digital exciter being operative to adjust the respective center frequencies of the at least one passband. The closest prior art, Toivola (US 6,081,515) in view of Wu et al. (US 6,985,434 B2), and Schilling (US 6,115,368) together discloses a similar system but fails to disclose the signal distributor further comprises at least one passband filter having at least one passband, each of the at least one passband having an associated center frequency, the digital exciter being operative to adjust the respective center frequencies of the at least one passband. This distinct feature has been added to the independent claim 1, thus rendering claims 1, 5, 10-11 allowable.

(2) Regarding claims 44, 49-52, and 54-55:

The present invention describes a receiver assembly, comprising a plurality of antennas that each receives an analog signal comprising at least one frequency band of interest and at least one frequency band containing an interfering signal; a signal combiner that combines at least two of the analog signals from the plurality of antennas into a multi-carrier signal; a bypass configured to allow an analog signal from ~ one of the plurality of antennas to bypass the signal combiner; an analog-to-digital converter

that creates a digital representation of the multi-carrier signal; a digital processing component that receives the digital representation of the multi-carrier signal and produces a control signal from the digital representation and the analog signal from the bypass, and for each analog signal representing an associated antenna, specifying the at least one frequency band containing the interfering signal; and a plurality of electrically adjustable stopband filters, each electrically adjustable stopband filter being associated with one of the plurality of antennas, a given electrically adjustable stopband filter being electrically adjustable to change respective associated center frequencies of at least one stopband associated with the filter in response to the control signal associated with the associated antenna of the given adjustable filter as to attenuate the specified at least one frequency band within the analog signal received at the associated antenna of the given adjustable filter. The closest prior art, Caimi et al. (US 2004/0227683 A1) in view of Nuutinen et al. (US 2003/0016771 A1) and Pratt (US6,664,921 B2) discloses a similar system but fail to disclose a bypass configured to allow an analog signal from one of the plurality of antennas to bypass the signal combiner and a digital processing component that receives the digital representation of the multi-carrier signal and the analog signal from the bypass, and produces a control signal from the digital representation for each analog signal, representing an associated antenna, specifying the at least one frequency band containing the interfering signal; and a plurality of electrically adjustable stopband filters, each electrically adjustable stopband filter being associated with one of the plurality of antennas, a given electrically adjustable stopband filter being electrically adjustable to change respective associated

center frequencies of at least one stopband associated with the filter in response to the control signal associated with the associated antenna of the given adjustable filter as to attenuate the specified at least one frequency band within the analog signal received at the associated antenna of the given adjustable filter. This distinct feature has been added to independent claim 44, thus rendering claims 44, 49-52, and 54-55 allowable.

(3) Regarding claims 56, and 63-64:

The present invention describes a receiver assembly, comprising:

a plurality of antennas that each receives an analog signal comprising at least one frequency band of interest and at least one frequency band containing an interfering signal; a plurality of mixers for downconverting the plurality of analog signals to an intermediate frequency, wherein each mixer have an associated oscillator producing appropriate signals for downconverting the analog signals; a plurality of spreaders for spreading the downconverted analog signals and produce a plurality of spreaded signals; a code division multiplexer that combines the plurality of spreaded signals from the plurality of spreaders into an analog multicarrier signal; an analog-to-digital converter that receives the analog multicarrier signal and creates a multicarrier digital signal comprising a representation of each analog signal in digital form; a digital processing component that receives the digital representation of each analog signal and produces a control signal from the digital representation for each analog signal, representing an associated antenna, wherein the digital processing component further comprises control components for computing and maintaining the codes for each signal path and providing codes to the spreaders; and a plurality of passband filters, each

passband filter being associated with one of the plurality of antennas. the closest prior art, Caimi et al. (US 2002/0122008 A1) in view of Takada (US 2002/0196876 A1) discloses a similar system but fails to disclose a plurality of mixers for downconverting the plurality of analog signal to an intermediate frequency, wherein each mixer have associated oscillators producing appropriate signals for downconverting the analog signals; a plurality of spreaders for spreading the downconverted analog signals and produce a plurality of spreaded signals wherein a digital processing component further comprises control components for computing and maintaining the codes for each signal path and providing codes to the spreaders. This distinct feature has been added to the independent claim 56, thus rendering claims 56, 63-64 allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SIU M. LEE whose telephone number is (571)270-1083. The examiner can normally be reached on Mon-Fri, 7:30-4:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Siu M Lee/
Examiner, Art Unit 2611
9/15/2010

/CHIEH M FAN/
Supervisory Patent Examiner, Art Unit 2611